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# THE COMMON BUTTERFLIES

AN OUTLINE FOR BUTTERFLY STUDY

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ANNA BOTSFORD COMSTOCK  
ASSISTANT PROFESSOR OF NATURE STUDY  
CORNELL UNIVERSITY

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# The Common Butterflies

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ANNA BOTSFORD COMSTOCK

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*Photo by Dr. R. W. Shufeldt*

## The Zebra Swallowtail

The summer form showing the long white-bordered tails

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Photo by Dr. R. W. Shufeldt

Spice-bush Swallow-tail (*Papilio troilus*); male. (Nat. size on negative). The vine is the Bindweed, and the flowers are of the Butterfly Milkweed.

15 N 32 14mm  

## THE COMMON BUTTERFLIES



THE BUTTERFLIES afford ideal material for nature-study, and especially for interesting the pupils in the mastery of a group. In almost any locality outside of the large city, there may be found in the course of a season thirty or forty species of butterflies, and at least twenty of these are common. Because the number is so small, the species are easily learned and most of them may be identified while on the wing. The teacher should bear this point in mind for it is a great advantage for a child to be able to identify a creature without having to kill it to make sure.

In 1906 when the editor was conducting the Home Nature-Study Course for Cornell University, a butterfly leaflet was issued as a part of this course. This leaflet was very popular at the time and there are still many requests for it from teachers and pupils of many states although the leaflet has been long out of print. Therefore, it has seemed wise to reprint it with such additions as will make it applicable to a wider range than New York State for which the original was written.

A pleasure similar to that afforded by the sight of a beautiful flower is experienced when the eye rests upon a bright hued butterfly. It may be balancing itself above its partner in beauty, the flower which gives it nectar, or it may be following the graceful curves of its path in the air, or if frightened it may zigzag by so swiftly that the eye only catches a bit of moving color; and although almost every one is attracted by these beautiful creatures, yet aside from two or three of the most common species very few people know their names or their habits. Yet each one of the butterflies has a most interesting life-history, and some of them are of great economic importance.



## THE ECONOMIC IMPORTANCE OF BUTTERFLIES

For the most part butterflies are not injurious; although while in the caterpillar stage they feed upon vegetation, most species



THE BLACK SWALLOWTAIL

Expanse three and one-half to four inches. Color brownish-black, the front wings spotted with yellow, the hind wings bearing yellow and blue spots. There is a red eye-spot at the inner angle of the hind wing.

live upon weeds of various kinds, and those that feed upon the leaves of trees rarely occur in such numbers as to do damage. The cabbage butterfly is a notable exception; it came to us from Europe and is now a widespread pest that would work destruction to the entire crop of cabbage and other cruciferous garden plants

if left alone. The caterpillars of the black swallowtail occasionally occur in sufficient numbers to damage celery, and the young of the giant swallowtail do injury to the foliage of orange trees; occasionally the caterpillars of the mourning cloak do some damage to elms. However, all butterfly caterpillars are easily gotten rid of by spraying the foliage on which they are feeding with poisoned water. The benefits conferred by butterflies are only partially known and little appreciated. Very many flowers depend upon butterflies for carrying and bringing pollen. The black swallowtail is especially beneficent in this respect. A large number of the species assist in cross pollinating the flowers of the plants on which their young feed and thus they pay back their debt. One little radical, the wanderer, has departed from the traditions of the butterfly family; its caterpillar feeds upon plant lice and thus is very helpful.

## THE LIFE HISTORY OF A BUTTERFLY

The life-history consists of four stages:

*First.*—The eggs which are laid upon the food plant by the mother butterfly; these eggs are often exquisite in color and beautifully ribbed and pitted so that when seen through the microscope they look like gems.



Eggs of Black Swallowtail, enlarged.

*Second.*—The caterpillars which hatch from these eggs and which feed upon the food plant until fully developed. Before reaching its full growth,



Caterpillar of Black Swallowtail in two stages of growth. The larger one has the scent organs protruding.

the caterpillar sheds its skeleton-skin four or five times; often this change of skin makes a change in the appearance and in the color of the caterpillar.

*Third.*—The pupa state or chrysalis. When the

caterpillar is full grown it sheds its old skin and appears in a very different form, that of the chrysalis or pupa. The pupæ of the butterflies are *never protected by a cocoon* as are the pupæ of moths. This is one of the chief differences between moths and butter-



Chrysalis of Black Swallowtail

flies. The caterpillar, before it changes to a pupa, makes a button of silk and sometimes also a loop of silk by which the pupa is suspended. As the insect when in the pupa or chrysalis state is helpless and unable to move, it is, therefore, an easy prey to birds and other enemies; thus the chrysalis is usually inconspicuous and placed in some position where it is not easily detected by even the keenest eyes.

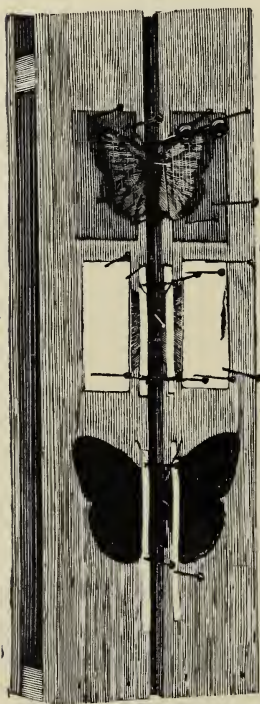
*Fourth.*—After a time the pupa skin is shed and from this comes the winged insect in all its beauty of color and form.

### HOW TO STUDY THE BUTTERFLIES

The caterpillars may be found on their food plant and reared indoors. This requires a great deal of care in providing fresh food and in looking after the wants of the little prisoners. This is the best way to study the insects, as we thus become acquainted with the caterpillar and its habits and also the chrysalis; and when finally the winged insect emerges we may become familiar with its colors and markings before we set it free to carry on its work of perpetuating the species and of carrying pollen for the flowers.

Or we may catch a butterfly with a net without injuring it and let it loose in the room where we can study it at close range and get thoroughly acquainted with its size, form and colors. This is an excellent way.

The most common way of studying these insects but perhaps not necessarily the best, is to make a collection of butterflies. This involves the catching of the insects in a net, and killing them in a cyanide bottle, or by pinching the thorax, and then spreading the wings carefully, letting them dry extended, and then placing the speci-



Spreading Board

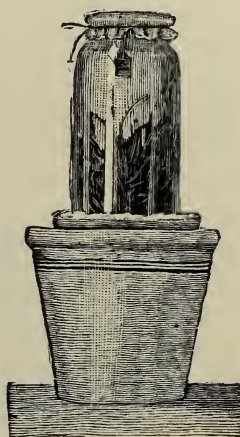
mens in a box for safe keeping. Every beginner experiences great trouble in keeping such specimens free from the little pests



which destroy them. The boxes of insects in any museum have to be looked over carefully every month and such as are infested treated with the deadly fumes of some gas. Undoubtedly the best and cheapest way for amateurs to mount their insects in permanent form is to use the Riker mounts which consist of shallow cardboard boxes with glass covers and filled with cotton. The size of box large enough for most of our butterflies costs fifteen cents each, and they come in cases, a dozen in a case. The butterfly is spread and placed on the cotton, the cover put on and sealed with gum paper and the specimen is safe for all time. As there is a box for each, any specimen may be passed around and studied by itself.

Such a collection of butterflies is a great help to a teacher as she is thus able to bring a page from nature's book into the schoolroom for the pupil's enjoyment and enlightenment. However, we by no means advise that the pupils themselves make a collection of insects, or that they be encouraged to do so.

While we do not advise the children to make collections of insects our reasons for doing so are based quite as much upon other grounds as upon that of developing cruelty in the child. The taking of life of the lower animals is a matter that had best not be too much dwelt upon before children, for we cannot be consistent in our teaching and they soon discover it. For who shall say that the cat which catches and eats the robin is more culpable than the person who eats lamb chop for breakfast, thus sacrificing the life of an innocent and playful creature to satisfy his appetite? And in the wider view of the Creator and his creatures, the life of a butterfly is no more sacred than that of the housefly or a mosquito. It is far safer to let these questions alone in our teaching and cultivate in the child an interest in the lives of the lower animals, thus bringing him into kindly relations with his little neighbors of the field, so that he will naturally respect their rights. It is the boy who knows the birds and loves them, who will not shoot them; it is the child who knows the butterfly by name and something of its interesting habits who will refrain from crushing the life out of its fragile body.



A Breeding Cage

We cannot eradicate cruelty by punishment or repression; but we may crowd it out of the child's character, by putting in its place little by little the humane and tender sentiments which inevitably follow a knowledge of the life and habits of even the lowest creature.

### FIFTY COMMON BUTTERFLIES

In the following descriptions the measurement of the butterfly is made across the spread wings from tip to tip; unfortunately, it was not practicable to have the pictures of all the butterflies natural size. It must be borne in mind that individual butterflies of the same species may vary in size somewhat. When the size of the caterpillar is given it means the fully grown larva just before it changes to a pupa.

#### THE SWALLOWTAILS

These are large handsome butterflies and get their name because of the prolongation of the hind wings in a manner suggesting the tail-feathers of a swallow. The caterpillars have a pair of scent organs just back of the head, which they can thrust out at will. These are supposed to protect them from the attacks of birds by rendering them disagreeable to smell and probably to taste.



THE TIGER SWALLOWTAIL

Expanse, three and one-half to four inches. Colors pale straw-yellow marked with black. On the hind wing near the inner angle are blue and red spots.

*The Tiger Swallowtail.*—This magnificent creature flies about leisurely and is fond of strong odors whether they be fragrant or otherwise. It is especially fond of tobacco smoke and will often be seen following in the wake of a smoker. The caterpillar has large eye-spots on the thorax, and it has a pretty habit of making a silken, spring mattress to rest upon when it is not eating; it makes this by weaving the web of silk across the leaf pulling the edges of the leaf slightly together. Food plants, ash, birch and poplar.

*The Black Swallowtail.*—This graceful insect is often found about our houses visiting the flower gardens. It is one of the most important pollen carriers among the butterflies. The male is



Caterpillar of the Tiger Swallow-tail resting on its silken mattress.



THE GIANT SWALLOWTAIL

This greatest North American butterfly has an expanse of five and one-half inches. It is black and marked with yellow bands diagonally across the wings and near the outer border.

smaller than the female, and has two complete rows of yellow spots on both wings. The caterpillar is mostly black and spiny when young but later it is adorned with green and black crosswise stripes, the black stripes enclosing six yellow spots. Food plants,

caraway, parsley, celery and wild carrot.

*The Giant Swallowtail.*—This is the largest butterfly in North America. It is a southern species and its caterpillars attack the



Caterpillar of Giant Swallowtail.

leaves of citrus fruits. It is a disagreeable looking creature, colored to imitate bird lime, and when disturbed, erects its head, throws out its scent horns and fills the whole neighborhood with an almost unbearable stench. It also feeds upon prickly ash and lombardy poplar and is sometimes found in the North.

The butterfly is magnificent and creates the greatest excitement when it appears in the Northern States as it sometimes does in late summer.

*The Zebra Swallowtail.*—The wings of the zebra are barred with blackish and greenish white which make it a striking butterfly. The length of its graceful tails is dependent upon the lateness of the summer. It is common in the Southern States where it goes through several generations each year. The caterpillar feeds upon pawpaw, spicebush and huckleberry.



THE ZEBRA SWALLOWTAIL

*The Green-clouded Swallowtail.*—The wings are black; the front wings with a row of pale straw colored spots near the outer margin, the hind wings are powdered with yellow - green or blue - green scales and each bears an orange spot at the middle of its front edge and one at the hind angle. Six pale crescents form an inside border to the hind wing. The tails to the wings are paddle-shaped and rather short. The caterpillar feeds upon spicebush

The wings are barred with blackish and greenish white. Near the base of each tail-like prolongation of the wings is a blood red spot, and beyond this are two purplish blue crescents.



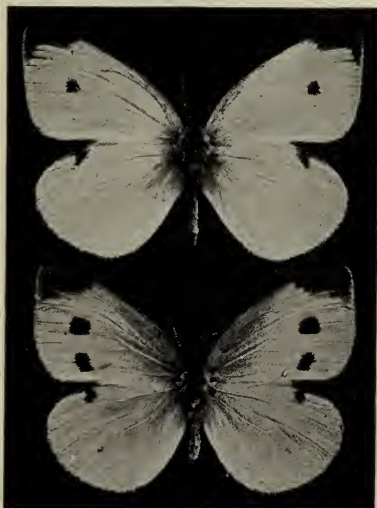
and sassafras. It has eye spots on its thorax. This species is common in the Southern States.

*The Blue Swallowtail*.—This is another black velvety butterfly with a blue shimmering sheen playing over its wings in the sunshine. The fringe on the outer margin of its wings is alternately black and white and each wing may have a row of whitish spots just inside the border. The expanse of wings is from three and one-half to four and one-half inches. Its caterpillars feed upon Dutchman's Pipe, Virginia snake-root, and black bindweed. It is a common species in the South and might be taken for the green-clouded species except that it has no orange spots on the hind wings.

## THE PIERIDS

### THE WHITES

*The Cabbage Butterfly*.—This is the white butterfly common near every garden in which grows cabbage or its near relatives. We had native species of cabbage butterflies which did comparatively little damage to gardens, although they were found quite commonly prior to 1870; but this emigrant *Pieris rapæ* came to us from Europe getting its foothold in New York State in 1868. Now it has driven out all of our native species; they have literally taken to the woods and are found only occasionally flitting about the wild cruciferous plants. The velvety-green caterpillar of the cabbage butterfly is very destructive and is well known. It feeds on other cruciferous garden-plants but prefers cabbage.



THE CABBAGE BUTTERFLY  
Expanse an inch and three-quarters.  
Color white with black spots. Male  
above, female below.

### THE ORANGE-TIPS

The orange-tips are seldom seen; they are smallish white butterflies marked with black and have the lower sides of the wings

marbled and netted with green. Many of the species, especially the males, have the front wings tipped with orange which gives them the name. Most of the species are found in the far West, only two are occasionally found in the East.

*The Flacate Orange-Tip*.—This butterfly has the apex of the front wings prolonged into a hook shaped point. Only the males have the front wings tipped with orange. The caterpillar feeds on cress, shepherd's purse and other crucifers.

### THE YELLOWS

*The Roadside Butterfly*.—This is the most common representative that we have of the yellows, and it may be seen in the



THE ROADSIDE BUTTERFLY

Expanse, one and three-fourths to two inches. Color bright, sulphur-yellow. Wings bordered with blackish. Spot on the fore wing black and on the hind wing orange-yellow.

summer in great numbers flitting above the flowers of our roadsides, or settled for a social drink about some mud puddle in the road. Its caterpillar is small, green in color, and feeds on clover, vetch, lupine, etc. It is so well concealed by color that it is rarely found.

*The Sleepy Yellow*.—This butterfly has a wing expanse of not quite two inches. Its wings are bordered with a broad black band and the

dark spot in front of the middle of the front wing extends up and down and is a mere line, looking like a closed eye. The caterpillars feed upon cassia, clover and senna. The species is common in the Southern States.

*The Dog's Head*.—The wide black border on the front wing of this butterfly outlines on the yellow a head that resembles that of a duck quacking more than that of any dog. However, the picture on the wing of the female is slightly like the profile of a poodle's head. The black spot forms a large and startling eye. The caterpillar feeds upon false indigo and clover. This species is abundant in the south western United States and Pacific Coast. Its wing expanse is about two and one-half inches.

*The Little Sulphur*.—This is a pocket edition of the roadside butterfly, marked like it except that it has a dot instead of a spot

on the front wing. Its expanse is less than one and one-half inches. It is common in the Southern States and northward. Its caterpillar feeds upon cassia and other legumes, preferring the fine-leaved varieties.

*The Orange Sulphur*.—This species resembles the roadside butterfly in size and markings but is orange instead of lemon yellow. It is found abundantly in the Mississippi Valley. Its caterpillars feed upon clover, vetch, etc.

*The Cloudless Sulphur*.—This splendid butterfly, the most beautiful of all the yellows, has an expanse of two and one-half inches and looks like a California poppy floating off its stem. The male is pure yellow with no markings, but the female has just a suggestion of black border on the outer edge of her wings and a black spot in front of the middle of each front wing. It is a common species in the Southern States, and late in the season pushes northward. The caterpillars feed upon cassia and other legumes.

## THE NYMPHS

### THE FRITILLARIES OR CHECKER-BOARD BUTTERFLIES

These are reddish-brown butterflies with many black spots on the upper sides of the wings giving them a checkered appearance; and with many silver spots on the lower sides of the wings. When we were children we used to call these round, silver spots "butterfly money," and it was one of our pastimes to gently seize one of these butterflies when we found it sucking nectar from some thistle blossom and count its money before we let it go.

*The Gulf Fritillary*.—This is a bright copper butterfly that bears some resemblance to the monarch since its veins in the outer portions of the wing are black. It has an expanse of two and one-half to three inches. It can always be distinguished from other butterflies by the form of the silver spots on the lower side of the wing which are bar-shaped rather than coin- or crescent-shaped. The caterpillars are spiny and feed upon the leaves of the passion flower. The species is found in the South from the Atlantic to the Pacific.

*The Regal Fritillary*.—This is the most magnificent of all the fritillaries, having an expanse of from three and one-half to four inches. Its front wings are copper color with dark borders, but its hind wings are black with yellowish or light spots. Underneath, the front wings are orange and the hind wings are a rich olive brown

ornamented with nearly thirty large silvery white spots. While in general it resembles the great spangled fritillary and the silver-spot, the black hind wings distinguish it from these species.



#### THE GREAT SPANGLED FRITILLARY

Expanse about three inches. Color orange (which fades to a dull brown late in the season) marked with black, the wings shading to brown next to the body. Undersides of the wings of the Great Spangled at the left; of the Silver Spot at the right.

*The Great Spangled Fritillary and the Silver Spot Fritillary.*—These two are of the same size and marked very similarly. The only way to distinguish the two species is to study the lower side of the hind wings; in the great spangled species there is a broad, buff band inside the silver spots that border the wings; it is one-fourth as broad as the wing itself. This band is very much narrower in the silver spot. The caterpillars of these species are velvety black and spiny, and feed on the leaves of violets.



*The Variegated Fritillary.*

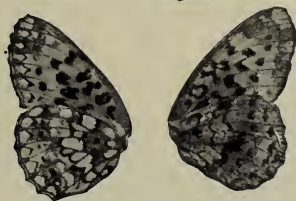
—This is another southern species and it has the real fritillary markings on the upper sides of the wings; there are no silver spots on the lower sides of the wings which are marbled with brown and white. It has a wing expanse of two and one-half inches. Its caterpillar is thorny and feeds upon passion flower, mandrake, violet and some other plants.



## THE VARIEGATED FRITILLARY

The wings are copper red crossed near the center with a paler band and the markings are blackish; no silver spots on lower side of wings.

*The Silver Bordered Fritillary and the Meadow Fritillary.*—These are two little fritillaries which resemble each other very much, but



may be easily separated by the fact that the silver bordered has the silver spots on the lower side of the hind wings, while the meadow has not a butterfly dollar on its wings anywhere. The caterpillars of these species are small, mottled green and spiny. They feed upon violets.

## THE CRESCENT SPOTS

*The Silver Crescent and the Pearl Crescent.*—These are two little butterflies which may be distinguished from other orange-yellow, small butterflies because there is so much of brown or black upon the wings that it is hard to tell whether that or the orange is the ground color. The lower sides of the wings are much paler than above and are marked with various shades of yellow in most complicated patterns. The caterpillars of these species are black

SILVER BORDERED FRITILLARY above; MEADOW FRITILLARY, below. Expanse, one and three-quarters inches. Color orange-yellow spotted with black. The underside of wings shows the "meadow" at the right.

marked with yellow or orange, spiny, and feed on sunflowers, asters and other composite plants.

*The Baltimore.*—This is another crescent spot, but is very striking in appearance. It is found near swampy places. Its caterpillar is black and orange banded and striped and spiny. The caterpillars of one brood live together like a happy family,



THE BALTIMORE

Expanse two inches. Color black with outer marginal row of reddish-orange spots and two parallel rows of very pale yellow spots.



PEARL CRESCENT,  
SILVER CRESCENT.

Expanse one and one-half inches. Color orange-yellow with black markings.

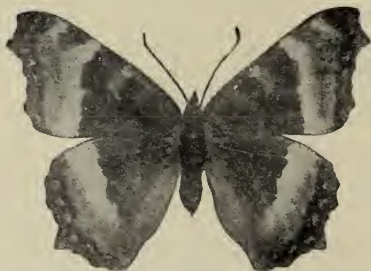
weaving leaves around themselves for protection; a queer thing about them is that during late summer the whole brood suddenly stops eating voluntarily and waits for winter to pass, although sur-

rounded by plenty of food. The food is snakehead.

#### THE ANGLE WINGS

These butterflies are so called because the edges of their wings look as if they were cut in sharp notches and scalloped with a pair of scissors; they are among our most interesting and beautiful butterflies.

*The American Tortoise Shell.*—This striking butterfly sometimes passes the winter as an adult and sometimes as a chrysalis. Its caterpillar is black with greenish sides and sprinkled with white raised



THE AMERICAN TORTOISE SHELL  
Expanse two inches. Wings blackish crossed by a broad band of orange brown which shades to yellow on the inner side.

spots; it is spiny. The caterpillars of the same brood live together feeding on the lower sides of the leaves which they fasten together making a protective abode. The food plant is nettle.

*The Compton Tortoise.*— This butterfly resembles very much the polygonias even having the 'embroidered' initial on the lower side of the hind wings. However, it differs in one particular. The hind margin of the front wings is straight and not



THE COMPTON TORTOISE

Expanse two and one-half inches, mottled with dark red and ochre yellow, like the colors of a tortoise shell. A white spot is on the front of each wing near the tip. The hind wings on the lower side each bear a small L-shaped silvery or white mark.

incurved. Its caterpillar is greenish in color more or less speckled with lighter color. It has black, bristly spines and the caterpillars of the same brood feed in a flock. The food plants are birch and willow.



THE MOURNING CLOAK

Expanse two and one-half to three and one-half inches. Color purplish-brown appearing black when flying. The wings have a broad, yellow border sprinkled with brown and just inside the border a row of blue or lavender spots.

*The Mourning Cloak.*— This butterfly which is well known in Europe is very common here. It winters as a butterfly and is the earliest of all our butterflies to appear in the spring. Its caterpillar is velvety black covered with white raised dots, and a row of red spots along the middle of the back. It has

rows of black spines. It feeds on elm, willow, poplar and other trees.





"Boo!"  
THE BUCKEYE

*The Buckeye.*—This is a southern butterfly that pushes northward late in the season. It has two eye spots on each front and hind wing, a large one and a small one. The small one on the front wing is often indistinct. Its general color is brown with a few

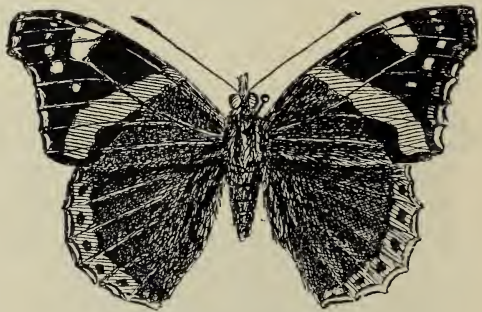
copper red markings; there is diagonal yellow band across each front wing. A very similar species is common on the Pacific Coast. The caterpillar is dark gray with lengthwise yellow stripes and spotted with yellow and orange. It is ornamented with branching spines. It feeds upon gerardin, figworts, snapdragon and plantain.

#### THE THISTLE BUTTERFLIES

Three of the angle wings are called the thistle butterflies because they are particularly fond of the nectar of thistle blossoms, and each one bears on the lower side of the wings a band of rich rose-color, which well matches the color of the thistle flowers.

##### *The Red Admiral.*—

This is one of our most striking and beautiful butterflies. The wings beneath are beautifully mottled and the front wings bear a diagonal band of rich rose-red. Its caterpillar is dull yellow, mottled with black with a yellow stripe along the side; it has many spines. It feeds upon nettles and hops.



THE RED ADMIRAL

Expanse a little less than two and one-half inches. Color purplish-black with white spots near the tips of the front wings. Orange-red band across front wings and bordering middle part of hind wings.

*The Painted Beauty and the Cosmopolite.*—These two species resemble each other very much; each has the hind half of the front wing colored rose-pink on the lower side; on the hind wing of the painted beauty are two eyespots while on the cosmopolite there are five or six smaller ones in a row. The caterpillar of the painted



beauty is velvety black with cross lines of yellow and with a row of white spots on each side back of the middle. It has bristly



THE PAINTED BEAUTY, above, THE COSMOPOLITE, below,  
showing under sides of wings at the right.  
Expanse of wings about two and one-half inches.

spines; it feeds upon everlasting and allied plants. The cosmopolite caterpillar is mottled, greenish-yellow with black and yellow stripes along the side. It has bristling yellow spines; its food plants are thistle, willow and everlasting. The cosmopolite has the widest distribution of any of our butterfly species. It is found in every part of the world except South America and the Arctic regions.

#### THE POLYGONS

These are distinguished from the other butterflies not only by the sharp notches and angles of the edges of the wings, but also by having the hind margin of the front wing cut out in a graceful curve. Each species has on the lower side of the hind wing near the center an initial or punctuation mark wrought in silver, this mark varying with the species. The flight of the polygons is very

erratic; they dash about making quick angles so that the eye cannot follow them. While the upper sides of the wings are bright orange red and quite striking, the lower sides of the wings are mottled in dull colors so that they resemble dead leaves or grass. All one of these butterflies has to do to become invisible when resting on the ground, is to close its wings above its back, and it is then almost impossible for the eye to detect it.

*The Violet Tip.*—

This is the largest of the polygons and the most graceful in form of all butterflies. It winters as an adult. The caterpillar is yellowish-brown with irregular spots and marks of lighter color. It has many branching spines, one pair being on the top of the head. It feeds on elm, hop, nettle, linden and hackberry.



THE VIOLET TIP

Expanse two and one-half to three inches. Color rich orange red spotted with black. The margins of the wings and tails violet color. The hind wing bearing a large silver semicolon on the lower side, shown at the right.

*The Hop Merchant.*—This looks on the upper side like a dwarf violet tip, for the margins of the wings are tinged with violet. It hibernates as a butterfly and is one of the earliest that we see in the woods in the spring. Its caterpillar is about an inch long, dark brown or greenish with blotches and lines and adorned with thorny spines one pair of which is on the head. It feeds on hops, nettle and elm. The chrysalis is a beautiful object ornamented with



THE HOP MERCHANT

Expanse two inches. Color bright orange-red with black spots. The borders of the wings dark brown shading off to violet at the margin. The "initial" on the lower side of the hind wings is like a badly made G.

knobs that shine like the precious metals. There is a superstition that if these knobs are golden the price of hops will be high; if they are silver, the price will be low.

*The Green Comma.*—This always hibernates as a butterfly. It may be distinguished from the gray comma, which it very much resembles, by the green tinge quite noticeable in the darker markings of the upper side of wing, and by the amount of olive green and the very different pattern on the lower side of the wings, and a quite different initial which is much like that of the hop merchant. Its caterpillar is a little more than an inch long, reddish or yellowish in color with a large patch of white on its back. Its branching spines are light colored. It eats the leaves of black birch, willow, alder, currant and gooseberry.

*The Gray Comma.*—This butterfly always hibernates as an adult and appears early in the spring. It especially frequents orchards.



THE GRAY COMMA

Expanse about two inches. Color orange-red with black spots brownish borders to the wings. The under sides of the wings are "pepper and salt" arranged in wavy lines. The "initial" a delicate wide-angled L.

Its caterpillar attains the length of an inch and has a body yellowish-brown marked with greenish-black. It has many branched spines one pair being on the head. It feeds on currant, gooseberry, and elm.

#### THE SOVEREIGNS

These butterflies are noted for the very interesting habits of the caterpillar which are omitted here. The caterpillars when fully grown are so covered with humps that they look most grotesque. On the front end of the body is borne a pair of tiny tubercles that look like pompons. The chrysalis has a projection which resembles a Roman nose.





*The Banded Purple or White Admiral.*—This beautiful and striking butterfly is quite local in its habits and spends its whole life near the same spot. It frequents shady roads. Its caterpillar feeds upon birch, poplar and shadbush.



#### THE WHITE ADMIRAL OR BANDED PURPLE

Expanse about three inches. Color velvety chocolate-black; the broad white band across the wings distinguishes it from other species.

#### THE RED-SPOTTED PURPLE

Expanse about three inches. Upper surface of wings velvety indigo-black tinged with blue or green iridescence. The border rows of spots on the hind wings a light iridescent blue. The wings on the undersides show many red spots.

*The Red-Spotted Purple.*—This is not so common in the North as the banded purple. There is a form which is hybrid between the two showing the trace of the

white band across the front wings, while the hind wings are usually like those of this species. Its caterpillar

feeds upon plum, thornapple and others.

*The Viceroy.*—This butterfly has forsaken the dark uniform of its family and has put on the dress of the monarch. This disguise affords it protection from the birds because the monarch is very distasteful to them, and they have learned to avoid all butterflies which look like it. The black band across the hind wings of the viceroy distinguishes it readily from the monarch. It is also a





Photo by Dr. R. W. Shufeldt.

THE VICEROY

Wings orange bordered with black in which is a row of white spots.  
Veins black. Black band across hind wing.

smaller butterfly. (See figure on page 237.) Its caterpillar feeds upon willow and poplar.

### THE EMPERORS

*The Goatweed Emperor.*—This handsome orange red butterfly



THE GOATWEED EMPEROR

The wings are bright-orange margined with brown with an irregular paler band just inside the brown margins.

can be distinguished from all others by the gracefully extended tips of the front wings and the equally striking points on the hind wings. It is a middle western and southern species. Its caterpillar is gray

and encrusted with little tubercles. It feeds upon goatweed.

### THE MEADOW BROWNS

These are brown butterflies which do not attract much attention from the uninitiated, but are very much loved by any real student of butterflies.

*The Blue-eyed Grayling and the Dull-eyed Grayling.*—These two species blend into each other, the blue-eyed being the southern form and the dull-eyed the northern form. The only difference between the two species is that the dull-eyed grayling lacks the broad yellow band on the front wings, but almost every grade between the two species may be found. The caterpillar attains the length of over one and one-third inches. It is green in



THE BLUE-EYED GRAYLING

Expanse two to two and one-half inches. Color dull brown with broad yellow bands crossing the front wings outside the middle. In this band are two black eye-spots, with little blue centers; small dark eye-spots on each hind wing.

color with yellowish stripes along each side. The body is covered with down, otherwise smooth. The rear end is forked. It feeds on grass.

*The Eyed-brown.*—This delicate fawn-colored butterfly repays well a little closer attention. Each velvety brown spot which ornaments the upper surface of the wings has a white center like a bull's eye on the lower surface. The caterpillar attains the length of one and one-fourth inches, is greenish in color and striped lengthwise. It is not only forked at the rear end, but has a pair of red horns at each end of the body; it hibernates when about



THE EYED-BROWN

Expanse about two inches. Color pale mouse-brown with a row of four velvety brown spots along the border of the front wing, and five or six smaller spots on the hind wing.



LITTLE WOOD SATYR

Wings nearly uniform dark brown. The small pupils of the eye-spots often double. Each eye-spot ringed with pale yellow.

half grown. It feeds on the coarser grasses and sedges.

*The Little Wood Satyr.*—This is a jolly little butterfly frequenting the shade of thickets and groves. It is single brooded and appears early in the season. The caterpillar is pale greenish brown and downy with blackish lengthwise stripes and it feeds upon grass.

## THE MILKWEED BUTTERFLIES

*The Monarch.*—This magnificent butterfly is a monarch indeed. The birds will not touch it and so it is afraid of nothing. Its flight is leisurely and extends over long distances. It does not winter with us, but comes to us each year from the South. In the fall it may be seen migrating back in flocks. Its caterpillar is banded crosswise with narrow black and yellow stripes. At either end of the body is a pair of whip-lash like organs; it attains the length of two inches. It feeds on milkweed; the chrysalis is plump and



A MONARCH CATERPILLAR

comparatively smooth, of an exquisite green color ornamented with dots of shining gold. (See figure on first page.)



A MONARCH CHRYSALIS

with black. The front wings are sprinkled with white dots inside the margins. The viceroy in Florida imitates the queen in color.

*The Queen.*—This is a Florida species. Its wings are chocolate brown bordered

### THE LONG-BEAKS

These butterflies are easily distinguished by their long beak-like palpi which are from one-fourth to one-half as long as the body—only two species are found in the United States.



THE SNOOT-BUTTERFLY  
Blackish brown marked with orange patches and white spots.

*The Snout-butterfly.*—This little butterfly looks as if it had had its front wing tips snipped off with curved scissors. It sometimes occurs in swarms but is usually rather rare. It haunts river banks and marshy places. Its caterpillar feeds upon hackberry.

### THE GOSSAMER WINGS

These are our smallest butterflies, few of them measuring more than an inch across the expanded wings. They include the hair streaks, coppers and blues.



## THE HAIR STREAKS

These little butterflies are distinguished from others by the long tail-like prolongations of the hind wings. They are usually dark brown with delicate striped markings on the lower surface of the wings; some species are brilliantly marked with metallic blue or green. About fifty species occur in North America. A table for determining the common species is given in *How to Know the Butterflies* p. 217.

*The Gray Hair Streak.*—This frisky little brown butterfly has a bright orange-spot on the hind wings and one or two white tipped tails; it also has orange on the tip of its antennæ and its head. Its caterpillar is less than a half an inch long and slug-shaped, and is naked and reddish-brown. It feeds upon the fruit and seeds of hop, hawthorne, hound's tongue and St. John's wort.

*The Banded Hair Streak.*—This is our commonest hair streak. It frequents openings in the woods especially scrub oak clearings; though dull in color it has on the inside at the tip of the hind wings a blue patch with an orange patch on each side of it. Its caterpillar is slug-shaped, half an inch long, grass-green in color and feeds on oak, hickory and butternut eating holes in the leaves; it winters as a newly-hatched caterpillar.



THE BANDED HAIR-STREAK

Expanse one and one-fifth inches. Color dark brown or blackish; lower side of the wings grayish with rows of black spots margined with white. Blue spot with orange spot on each side of it on the hind angle of the lower wing.

## THE COPPERS

These are distinguished from the other gossamer wings by their orange-red and brown colors.

*The Wanderer.*—This lovely little butterfly is usually found near alders. Its caterpillar is rather wide in the middle and pointed at each end, about one-half inch in length; its color is brown marked with brownish stripes. It differs from the caterpillars of other butterflies in that it is not vegetarian, but lives instead, upon the woolly plant-lice which infest the alder and thus is a very good friend to this tree. For figure see next page.

*The American Copper.*—These jolly midgets flit about over lawns almost always playing with each other and sometimes even daring to play with us as we cross their path. The caterpillar is

slug-shaped, a half an inch long, dull rosy-red in color; it feeds on sorrel.



THE WANDERER

Expanse a little over an inch. Color dark brown with large irregular orange-yellow patch in the central part of the fore wing and a similar patch on the outer half of the hind wing.



THE AMERICAN COPPER

Expanse about an inch. Color of front wings red with black spots and borders; hind wings coppery-brown with broad orange-red band on the outer margins.

### THE BLUES

*The Spring Azure.*—This bit of a blue butterfly comes to us early in the spring and seems like a promise of blue skies and sunshine. Its caterpillar is two-fifths of an inch in length, slug-shaped, whitish



Male



THE SPRING AZURE

Expanse about an inch. Color blue with purplish tinge; wings bordered more or less with black.



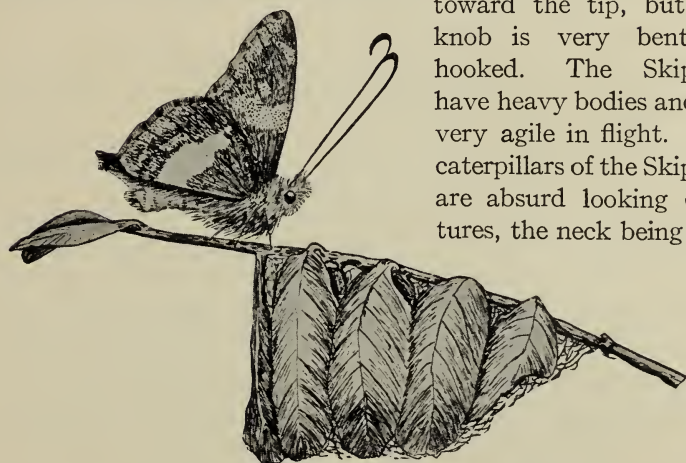
Female

with dark brown head. It lives on the flowers of dogwood, sumac, spiræa and others. A remarkable thing about the caterpillar is that it bears an organ on the back which exudes honeydew; ants feed upon this and protect the caterpillar.

### THE SKIPPERS

There is a family of insects usually included with the butterflies called Skippers. These are usually small dark brown or dull yellow and may be distinguished from the butterflies by the fact that the antennæ are either hooked at the tips or bent at an angle. The character which distinguishes butterflies from moths most readily is that the butterflies always have antennæ which are enlarged at or toward the tips. Knobbed antennæ they are called; while the antennæ of moths may be straight and simple or feather-like. The

antennæ of the Skippers are enlarged like those of the butterflies



toward the tip, but the knob is very bent or hooked. The Skippers have heavy bodies and are very agile in flight. The caterpillars of the Skippers are absurd looking creatures, the neck being very

**THE SILVER SPOTTED SKIPPER ABOVE THE NEST OF ITS CATERPILLAR**  
Color chocolate brown—the front wings marked with yellow and the lower wings marked with white on under side. Its caterpillar forms a nest by fastening together the leaflets of locust leaves.

small and the head very large. They usually live concealed in a folded leaf or in a nest made of a few leaves fastened together.

There are about two hundred species of Skippers in America north of Mexico and they are very difficult to determine except in the case of some of the larger and well marked species. In one sub-family which are largely of tawny or orange brown color, there is an oblique dark patch across the front wing. To another sub-family belong most of the blackish or dark brown or dusky winged Skippers often dotted with white or lighter yellow and which have a little fold along near the front border of the front wing.

The main thing for the beginner in the study of butterflies to achieve is to know a Skipper when he sees it and to be able to say at once, 'this is a skipper and not a butterfly.'



A male skipper with a diagonal "brand" across the front wings. Many of these are coppery yellow and brown in color.



A male skipper with a fold near the front margin of the wing. Most of the species are dark brown marked with white or translucent angular spots.

## COLOR KEY TO THE COMMON BUTTERFLIES

Based upon a Laboratory Exercise in Nature-Study at Cornell University

By HELEN M. HESS

A. Large butterflies—strikingly black and yellow. Hind wings with tails.

B. Wings yellow, margined with black with four black bars across the front wing. Expanse  $3-3\frac{1}{2}$  in.

*Tiger Swallowtail—Turnus form*

BB. Wings black above, yellow beneath with broad diagonal band of yellow from tip of front wing across base of hind wing. A row of striking yellow sub-marginal spots across hind wings and merging into diagonal band on fore wing. Wing expanse 4-5 in. *Giant Swallowtail.*

BBB. Wings black, with double row of yellow marginal spots on front wing, the inner row making a yellow band across the hind wing. Wing expanse  $2\frac{1}{2}-3$  in.

*Black Swallowtail, male*

AA. Butterflies mostly black. Wing expanse  $2-3\frac{1}{2}$  in.

B. Hind wings with tails.

C. Front wings black with pale spots near outer margin in single row and often rather inconspicuous.

D. Hind wings with blue spots or green inside the outer row of yellow spots.

1. Often six crescent shaped spots along the outside of the hind wing. The lower and especially upper one orange. The others yellowish.

*Tiger Swallowtail—Glaucus form.*

2. The pale marginal spots along outer margin of hind wing all the same color. An orange spot at the middle of front margin and two orange spots near inner angle of hind wing.

*Green-clouded Swallowtail, female.*

DD. The hind wings greenish and with only one orange spot at inner angle of hind wing.

*Green-clouded Swallowtail, male.*

DDD. Hind wings metallic dark blue. No orange spots on upper side. On the lower side the marginal row of spots orange below, pale above.

*Blue Swallowtail.*



CC. Front wings with double row of yellow spots.

1. Hind wing with yellow band across the middle.

*Black Swallowtail, male.*

2. Hind wing with a row of blue spots between the outer and inner row of yellow spots.

*Black Swallowtail, female.*

BB. Hind wings without tails.

C. Wings with white markings.

1. With wide white band across the middle of both wings.

*Banded Purple or White Admiral.*

2. With band across only the front wings.

*The Hybrid Purple.*

3. Diagonal red band across front wings which are spotted with white near tips. Orange red border to hind wings.

*Red Admiral.*

4. Wings bordered with orange yellow spots and outer third checkered with cream white. Rather small.

*The Baltimore.*

5. Small blackish butterflies, peppered with white, with tips of antennae bent. Belong to the family of

*Skippers.*

CC. Wings with no white markings.

1. Hind wings with border of three rows of blue or greenish spots, and underneath a border of seven orange spots just within a double row of blue or green spots.

*The Red-spotted Purple.*

2. Wings with brownish tinge with broad border of pale yellow. Just inside the border a row of blue or purplish spots.

*The Mourning Cloak.*

AAA. Butterflies with general color of copper red or brick color.

B. Large, with wing expanse of  $2\frac{1}{2}$  to 4 inches.

C. Veins completely outlined with black.

1. With no transverse black band across hind wing.

*The Monarch.*

2. With transverse black band across hind wing.

*The Viceroy.*

- CC. Veins outlined with black near outer border. Large silvery spots on underside of hind wing.

*The Gulf Fritillary.*

- CCC. Veins not outlined in black. Wings coppery, checkered and spotted with black. Inner half of wings dark brown. No white markings.

- D. Under sides of hind wings with large silver spots.

1. A broad buff band inside the border of silver spots on lower side of hind wing.

*The Great Spangled Fritillary.*

2. A narrow buff band inside the outer row of silver spots on border of under surface of hind wing. The band not so wide as the silver spots in border.

*The Silver-spot Fritillary.*

- DD. Under side of the wings marbled in yellowish and browns.

*The Variegated Fritillary.*

- CCCC. Front wings coppery, checkered with black. Hind wings black with lighter spots. Very large butterfly. Expanse 4 inches. The front wings orange beneath, the hind wings olive brown with about thirty large silvery white spots.

*The Regal Fritillary.*

- CCCCC. Orange red with tips of front wings prolonged with curved points and with short tail on hind wing.

1. Narrow margin of brown borders the wings. A small dark spot in middle of margin of front wing.

*Goatweed Emperor, male.*

2. Broad border of brown with paler orange inside it, and brown spots inside this pale band.

*Goatweed Emperor, female.*

- CCCCCC. Copper red and black butterflies with tips of front wings blackish, spotted with white.

- D. Hind half of lower side of front wings rose color.

1. Lower side of hind wing showing two eye-spots within the border.

*The Painted Beauty.*

2. Lower side of hind wing showing four eye-spots within the border.

*The Cosmopolitan.*

DD. Copper red, diagonal band across front wings, which is vivid rose red below; red border to hind wing.

*Red Admiral.*

BB. Smallish copper red or copper yellow and black butterflies. Wing expanse from  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches.

C. Copper red checkered with black above. Edges of wings not notched.

1. Lower side of hind wing with silver spots.

*Silver-bordered Fritillary.*

2. Lower side of wings with no silver spots.

*Meadow Fritillary.*

CC. Orange with black border and many black irregular markings. Margin of wings not notched. Lower side of wings marbled with yellows and browns.

1. A distinct narrow yellow line bordering lower sides of wings.

*The Silver Crescent.*

2. No distinct yellow line bordering lower sides of wings.

*The Pearl Crescent.*

CCC. Copper red and black butterflies. The edges of the wings notched and under sides of wings marbled browns of different shades.

D. With a white "initial" at center of lower side of hind wing.

1. The initial of two silvery marks, a crescent white line and a dot. Wings above bordered with lavender

*The Violet Tip.*

2. The outer third of the lower surface of the wings variegated with olive green. The initial a C or a G.

*The Green Comma.*

3. Outer third of the lower surface of the wings variegated with wood brown. The initial also a C or a G.

*The Hop Merchant.*

4. The marbled surface of the under side of the wings crossed by many fine ashen lines. The initial an L. *The Gray Comma.*

DD. With no initial on hind wings.

1. Wings blackish with a broad orange red band marking the outer half of both wings. *The American Tortoise Shell.*

BBB. Very small copper red or coppery yellow butterflies, not expanding over one inch.

1. Front wings copper red, spotted with black and outer margin blackish. Hind wings dark with bright copper outer border.

*American Copper.*

2. Front wings dark brown with large irregular orange yellow patch over the middle. The hind wings brown with orange yellow patch extending forward from hind margin. *The Wanderer.*

AAAA. White butterflies.

B. With front wings tipped with black.

1. With two spots on front wing.

*Cabbage Butterfly, female.*

2. With one spot on front wing.

*Cabbage Butterfly, male.*

3. With black blotch at middle of margin of front wing. *Olympia Orange Tip.*

BB. With front wings prolonged at tip to a hook.

1. Wings tipped with orange.

*Falcate Orange Tip, male.*

2. Front wings bordered with delicate black spots.

*Falcate Orange Tip, female.*

AAAAA. Butterflies conspicuously yellow.

B. With tails to the hind wings.

1. Large, with black border and four black bars extending back from front margin of front wing.

*Tiger Swallowtail, Turnus form.*

BB. Hind wings without tails. Expanse 2 inches or less.

C. With black border on outer margin of wings.

D. Lemon yellow.

1. With outer black border unbroken.

*Roadside male.*



2. With black border on front wing broken with yellow spots.  
*Roadside female.*
3. With deep black border outlining the profile of a head, and with black base to front wing.  
*The Dog's Head.*
4. With outer border unbroken. A small butterfly only one inch in expanse.

*Little Sulphur.*

DD. Orange yellow butterflies.

1. The black border unbroken and with oval spot at center of front wing near margin.  
*Orange Sulphur.*
2. Black border unbroken in male but fading out on the hind portion of the hind wings in the female. Spot at middle of front wing, near margin a mere line.

*The Sleepy Yellow.*

CC. Lemon yellow with no solid black border. Large butterfly  $2\frac{1}{2}$  inches in expanse.

1. With black spots bordering the wings and with round spot at the front middle of front wing.  
*Cloudless Sulphur, female.*

2. With no black spots of any kind, just pure yellow.  
*Cloudless Sulphur, male.*

AAAAAA. Butterflies conspicuously brown or gray.

B. Rather large with an expanse of 2 to  $2\frac{1}{4}$  inches, with no tails on hind wings.

C. With one large eye-spot and one very small one on front wings, and with one large and one small eye-spot on hind wings.

1. Diagonal band of yellow across tips of front wing and two copper red bars extending back from the margin of front wing. Copper red near margin of hind wing.

*The Buckeye.*

CC. With two equal sized eye-spots on front wings. Expanse 2 inches.

1. With the eye spots on the front wing set in a band of yellow.

*The Blue Eyed Grayling.*

2. With no band of yellow surrounding eye-spots on front wing.

*Dull Eyed Grayling.*

3. The eye-spots on front wing each surrounded by yellow ring or set in yellow patch.

*Hybrid Grayling.*

- CCC. With two equal spots on front wing. Expanse  $1\frac{1}{2}$  inches. With two eye-spots on hind wings and sometimes a smaller one.

*Little Wood Satyr.*

- CCCC. With four small eye-spots in a row on front wings.  
With five small eye-spots along margin of hind wing.

*The Eyed Brown.*

- BB. Small butterflies with thread-like tails or with short projections on hind wings.

*The Hair Streaks.*

- BBB. Small butterflies without projections on hind wings.  
With rather heavy bodies and antennæ bent at the tip.

*The Skippers.*

- AAAAAAA. Butterflies blue or marked conspicuously with blue.

- B. Small butterflies mostly blue.

- C. Without tails to hind wings.

1. Lower sides of wings pale ash gray. Expanse about one inch. *The Spring Azure.*

- CC. With tail-like prolongation to hind wings.

*Hair Streaks.*

- BB. Large black butterflies without tails to hind wings, marked with double row of blue spots near border of hind wings.

*The Banded Purple.*

- BBB. Large butterflies with tails to hind wings.

1. Black butterflies, sheen on hind wings blue or greenish blue. *Blue Swallowtail.*

*Green-clouded Swallowtail.*

2. Black butterflies with blue spots on hind wings.

*Glaucus form of Tiger Swallowtail.*

*Black Swallowtail, female.*

- BBBB. Black butterfly with slight tail like prolongation on hind wings. With yellow border and row of blue spots inside of it.

*Mourning Cloak.*

Check list  
of Fifty  
Common  
Butterflies

Swallowtails

{ Tiger  
Black  
Zebra  
Giant  
Green-clouded  
Blue

Pierids

{ Whites { Cabbage  
Orange tips { Falcate  
Roadside  
Sleepy Yellow  
Dog's Head  
Yellows { Little Sulphur  
Orange Sulphur  
Cloudless Sulphur

Nymphs

{ Fritillaries { Great Spangled  
Silver spot  
Regal  
Gulf  
Variegated  
Meadow  
Silver-bordered

{ Crescent  
Spots { Pearl  
Silver  
Baltimore

{ Angle-  
wings { Mourning Cloak  
American Tortoise  
Compton Tortoise  
Buckeye

{ Thistle  
Butterflies { Red Admiral  
Painted Beauty  
Cosmopolite

{ Polygons { Violet Tip  
Hop Merchant  
Gray Comma  
Green Comma

{ Sovereigns { Banded purple  
Hybrid purple  
Red-Spotted purple  
Viceroy

{ Emperors { Goatweed Emperor

Meadow  
Browns

{ Blue-eyed Grayling  
Dull-eyed Grayling  
Eyed Brown  
Little Wood Satyr

The Milkweed

{ Monarch  
Queen

Long Beaks

{ The Snout Butterfly

The Gossamer  
Wings

{ Hair Streaks { Gray Hair Streak  
Banded Hair Streak  
Coppers { Wanderer  
American Copper  
Blues { Spring Azure



*Photo by Dr. R. W. Shufeldt*

Two Monarch Butterflies on Goldenrod





The Mourning Cloak caterpillars are sociable even when changing to chrysalids

# HOW TO KNOW THE BUTTERFLIES

A Manual of the Butterflies of the Eastern United States, *by*

**JOHN HENRY COMSTOCK**

*Emeritus Professor of Entomology, Cornell University*

AND

**ANNA BOTSFORD COMSTOCK**

*Assistant Professor of Nature Study, Cornell University*

This work contains descriptions of 152 species and varieties of butterflies. This includes all of the species and their named varieties found in the eastern half of the United States excepting a few extremely rare forms.

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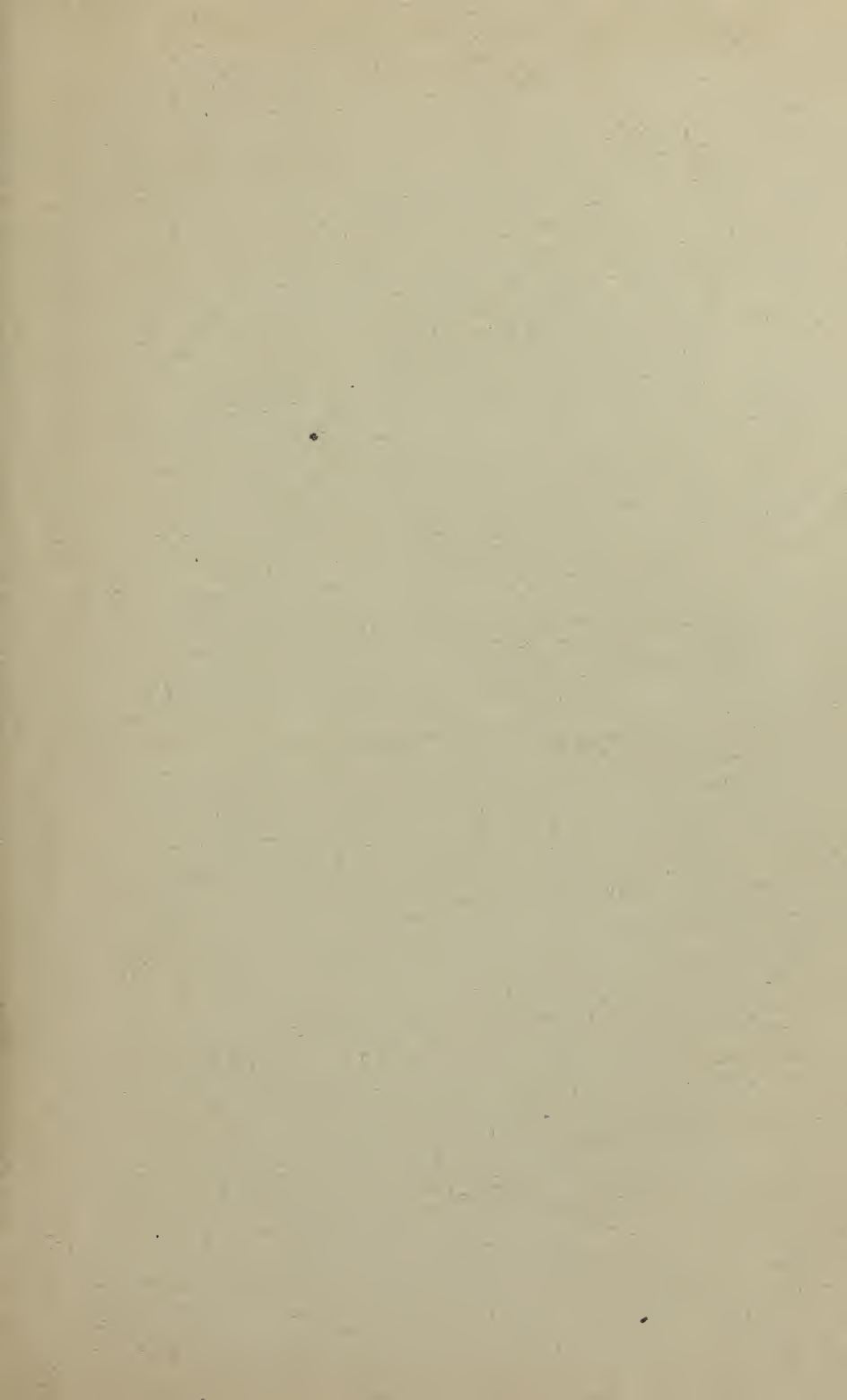
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